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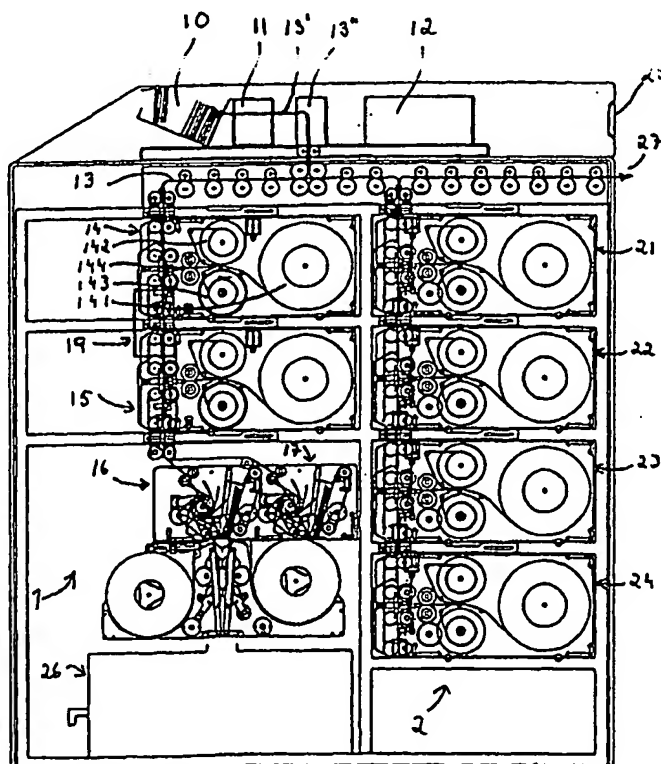
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: MACHINE FOR RECEIVING AND ENCLOSING BANK NOTES, WHERE INFORMATION IS PRINTED ON THE INSIDE OF A TRANSPARENT FILM

## (57) Abstract

A banknote handling machine has an infeed part (1) for customer identification and for receiving banknotes deposited by the customer from outside the machine. The machine also includes means (11) for checking the validity of deposited banknotes, and means for printing information relating to customer deposited banknotes. A process unit (12) functions to control transportation of banknotes that have been found to be possibly false by the detector means (11) to a unit (16-18) for storing and packaging banknotes that are suspected of being false, and to control the means (181) for printing customer information and information relating to any suspect banknotes encountered in conjunction with the storage and packaging of banknotes that are suspected of being false. This information is printed in mirror image on the upper side of transparent packaging material (180), this upper side thus becoming the inside of an established package, so that the information will be durable and difficult to manipulate without being noticed.



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**MACHINE FOR RECEIVING AND ENCLOSING BANK NOTES, WHERE  
INFORMATION IS PRINTED ON THE INSIDE OF A TRANSPARENT FILM**

**FIELD OF INVENTION**

5     The present invention relates to a banknote handling machine  
and more specifically to a machine that includes an infeed  
part for customer identification and for receiving banknotes  
deposited by the customer from outside the machine, detection  
means for checking the validity of the deposited banknotes,  
10    and means for printing information in respect of customer  
deposited banknotes.

**BACKGROUND OF THE INVENTION**

15    Automatic telling machines that are provided with means for  
detecting false banknotes are known to the art. Any false  
banknote that is detected is not returned to the depositing  
customer, but is stored in the machine and later becomes the  
subject of a separate investigation.

20    The procedure undertaken with such an investigation can be  
relatively complicated and tediously long, which makes it  
difficult to establish the source of the false banknote, or  
may make such establishment impossible. The object of the  
25    present invention is to endeavour to eliminate the aforesaid  
drawback and other drawbacks, among other things.

**SUMMARY OF THE INVENTION**

30    A banknote handling machine of the aforescribed kind  
includes a process unit which functions to control the  
transportation of a banknote which the detector means  
suspects to be false, to a separate unit for storing and  
encasing, packaging, suspected false banknotes, and also  
35    controls means for printing customer related information and  
information relating to any possibly false banknotes detected

in conjunction with storing and packaging the suspected false banknote.

#### BRIEF DESCRIPTION OF THE DRAWINGS

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The invention will now be described in more detail with reference to the accompanying schematic drawings, in which Fig. 1 illustrates an inventive banknote handling machine; Fig. 2 illustrates in somewhat larger scale a unit for  
10 storing and packaging suspected false banknotes included in the machine according to Fig. 1; and Fig. 3 illustrates a packaging mechanism included in the machine according to Fig. 1.

15

#### DESCRIPTION OF PREFERRED EMBODIMENTS

The inventive banknote handling machine includes an infeed part 1 and an outfeed part 2.

20

The infeed part 1 includes a deposit compartment 10, detector means 11, a process unit 12, a conveyor path 13'-13"-13, first storage means 14, second storage means 15, first stacker means 16, second stacker means 17, and a packaging or encasing unit 18.

25

Banknotes deposited in the machine are bundled and placed into the deposit compartment 10, possibly in different denominations, said compartment accommodating up to 500 banknotes. These banknotes are separated one after the other  
30 and conveyed along an upper conveyor path 13', past the detector means 11 and up to guide means (direction changing) 13", which lead the banknotes down to a lower conveyor path 13.

35

The detector means 11 is placed in the close proximity of the deposit compartment 10 and is adapted to sort false

banknotes, poor quality banknotes and other banknotes from the arriving banknotes. By sorting is meant here that passing banknotes are "marked" in some way so that respective banknotes can be handled as being "possibly false", "poor quality" or "accepted" in the subsequent transportation of the banknotes.

The storage device 14, and also other similar storage devices in the machine, has two belts between which banknotes are stored, a storage drum 141 and two unwinding drums 142 and 143. The leading edge of a banknote arriving at the said storage device actuates a sensor 144 which therewith starts-up three motors which each drive a respective drum 141-143. The banknote is drawn about 120 mm in between the belts, which are together wound-up on the storage drum 141, which can accommodate about 500 banknotes. As the belts are coiled on the drum, information relating to the banknotes is sent to the process unit 12, whereby an account can be kept of the sequence between the banknotes. When banknotes are taken from the device 14, impulses are sent to the motors causing the drums to be driven in opposite directions.

A manipulator 19 provided along the conveyor path close to the storage devices 14, 15 functions to correct the positions of any banknotes that may have been twisted or displaced laterally during their transportation.

Each of the stacker device 16, 17 includes a so-called stacker wheel which gathers sequentially arriving banknotes into a bundle in a storage compartment. When the bundle contains the intended number of banknotes, the bundle is clamped by a pair of arms and fed down to the packaging unit 18.

The packaging unit 18 includes two rollers that carry packaging material (plastic material). A banknote bundle to

be packaged is drawn down into a pocket that consists of two plastic strips of the same length and width, one from each roll. The plastic strips are pressed together around the bundle and welded along their edges with the aid of a  
5 Teflon®-coated heating wire. The reader is referred to U.S. Patent Specification 5,031,379 for a more detailed explanation of this known technique.

10 The process unit 12 controls the transportation of poor quality banknotes along the conveyor path 13 to the units 16 and 18 for storage and packaging of these banknotes. This unit is comprised of the stacker device 16 and the packaging device 18.

15 The process unit 12 also controls the transportation of at least some of the remaining genuine and accepted banknotes to unit 14-17-18 for storing and packaging these banknotes in accordance with their denominations. This unit is comprised of the storage device 14, the stacker device 17 and the  
20 packaging unit 18.

The manner in which the process unit 12 controls the passage of banknotes along different parts of the conveyor path 13 to their different destinations, with the aid of path selectors, detectors, etc., is known to the art and will not therefore  
25 be described in detail here.

Any suspect banknotes encountered in the detector device 11 can be transported to the stacker device 16 for instance, and  
30 from there to the packaging unit 18 where they are packaged together with an automatically printed receipt that includes the number of banknotes, the date, etc., and also information relating to the customer depositing the banknotes, e.g. through the medium of an account number. This enables the  
35 source of false or suspect banknotes to be investigated.

Fig. 2 illustrates the stacker device 16 and the packaging device 18 in positions in which they form a unit 16-18 for storing and packaging suspected false banknotes. A printing device 181 is provided for printing directly on the inner surface of packaging material (the plastic strip) in mirror image customer related information and information relating to encountered suspect banknotes (preferably several such banknotes). Transportation of the banknote (the banknotes) and printing of said information is controlled by the process unit 12. Thus, in the event of detecting several banknotes that are suspected of being false on one and the same depositing occasion, these banknotes will be collected in one and the same package on which durable information disclosing the contents of the package has been printed.

Fig. 3 illustrates the actual packaging mechanism, including the rolls 182, 183 of plastic packaging material 184. The ends of the material taken from the two rolls are welded together at 185 (after a preceding packaging operation) and form the bottom of a disposable cassette or package for receiving a banknote (banknotes) fed down from above. The printing device 181 is mounted above and close to the roll 182 with the printing head 181 of said device close to a guide roller 186 and at the upper side of the plastic material 184, this side thus becoming the inside of the package or cassette when a banknote (banknotes) is fed down in between two plastic lengths, one from each roll, and said lengths are then welded together to form a closed package or cassette. It is important that the print is applied close to the weld join 185.

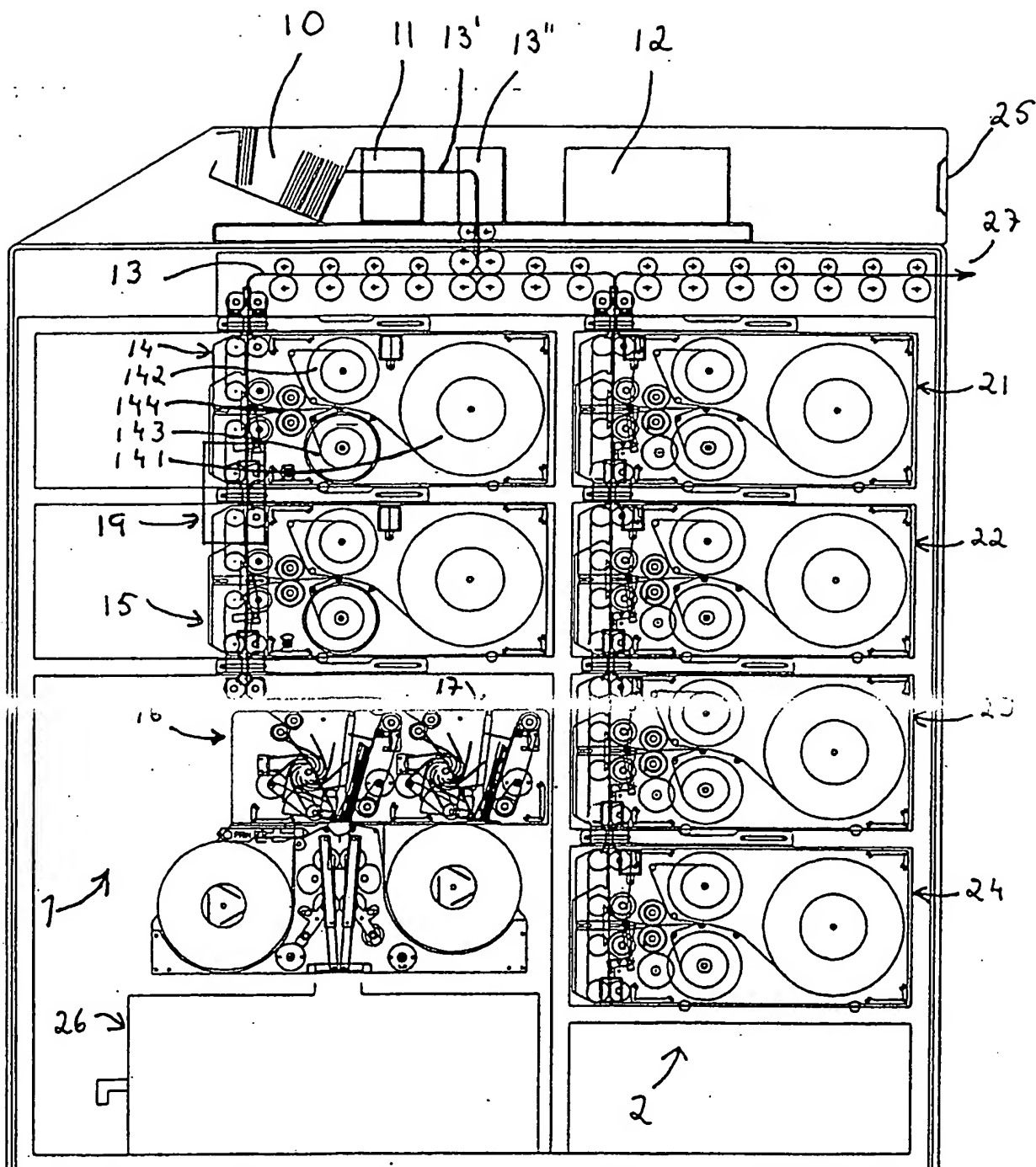
## CLAIMS

1. A banknote handling machine that has an infeed part (1) for customer identification and for receiving banknotes  
5 deposited by the customer from outside the machine, detector means (11) for checking the validity of the deposited banknotes, and means (181) for printing information relating to customer deposited banknotes, characterised in that the machine includes a process unit (12) which is adapted to  
10 control the transportation of a banknote which is suspected of being false by the detector means (11) to a unit (16-18) for storing and packaging, encasing, banknotes that are suspected of being false, and also to control the means (181) for printing customer information and information relating to  
15 a suspect banknote in conjunction with storing and packaging suspect banknotes.

2. A banknote handling machine according to Claim 1, characterised in that the printing means (181) is adapted to  
20 print information on the upper side of transparent packaging material (180) immediately prior to a packaging operation, this upper side thus becoming the inside of the established package, whereby the information becomes durable and difficult to manipulate unnoticed.



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Fig 1



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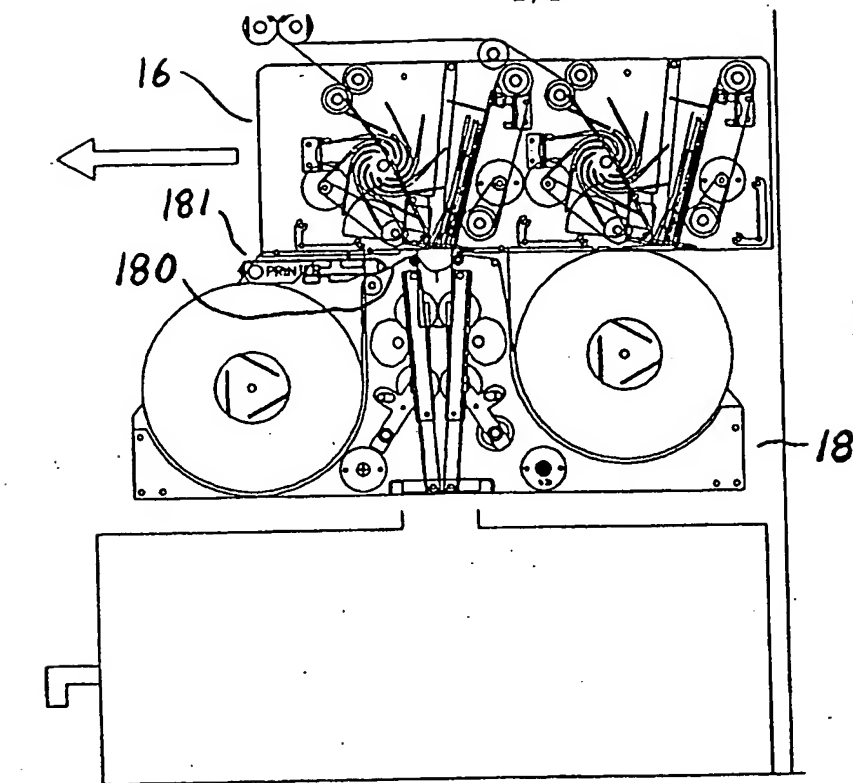


Fig 2

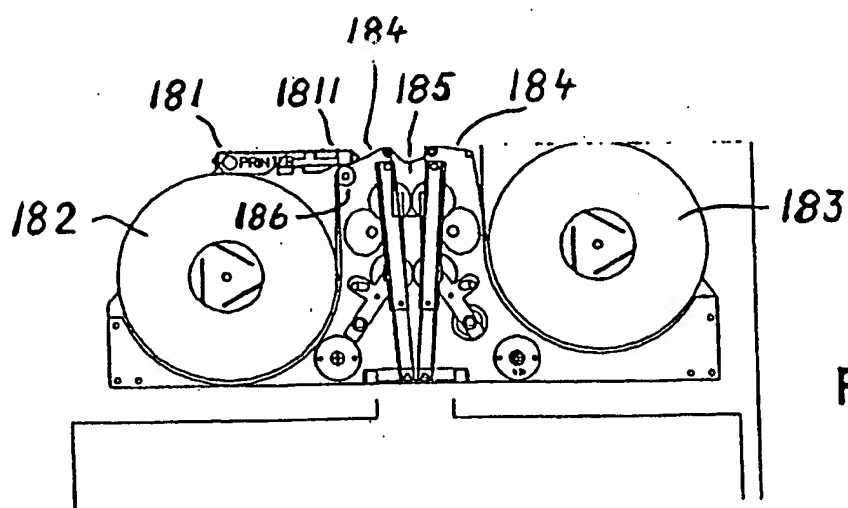


Fig 3

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INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE 99/01866

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G07D 11/00 // G07D 9/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G07D, B65B, G06M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0871149 A1 (NCR INTERNATIONAL INC.), 14 October 1998 (14.10.98), The whole document  --	1-2
A	Patent Abstracts of Japan, abstract of JP 9-169323 A (MARUTO SANGYO KK INAGAKI HIROMICHI), 30 June 1997 (30.06.97), Letters are reversed printed on transparent film  --	1-2
A	JP 9-169323 A (MARUTO SANGYO KK INAGAKI HIROMICHI), 30 June 1997 (30.06.97), Letters are reversed printed on transparent film  --	1-2

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SE 9501403 A (LARSON & CO. INTERNATIONAL), 19 October 1996 (19.10.96), figures 1,2, Especially details 104 and 204  -- -----	1-2

INTERNATIONAL SEARCH REPORT  
Information on patent family members

02/12/99

International application No.  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0871149 A1	14/10/98	GB 9707243 D JP 10289349 A	00/00/00 27/10/98
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SE 9501403 A	19/10/96	AU 692014 B AU 4126496 A BR 9509831 A CZ 9701574 A EP 0804273 A FI 972233 A JP 10509914 T PL 320426 A SI 9520141 A SK 66197 A	28/05/98 19/06/96 30/09/97 12/11/97 05/11/97 27/05/97 29/09/98 29/09/97 31/10/97 08/10/97